

ARTHRITIS AND VENEREAL URETHRITIS*†

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The clinical course of arthritis associated with venereal urethritis was clearly defined before 1900. Brodie (1818, 1836), Fournier (1868-69), and Launois (1899) published excellent descriptions of the disease, noting the predilection of the arthritis for the joints of the lower extremities, the relapsing course, and the frequency of complications affecting the eyes. Launois gave an accurate account of an attack of keratoderma blennorrhagica occurring during severe arthritis, and investigation of the accompanying urethritis in this case failed to reveal the gonococcus. Fiessinger and Leroy (1916) and Reiter (1916) described the syndrome of urethritis, arthritis, and conjunctivitis following bacillary dysentery, and in the same year Waelsch (1916) observed a similar triad of symptoms in his investigation of 44 cases of abacterial urethritis of venereal origin. Hollander (1946) reported 53 patients with "non-specific" urethritis in whom arthritis developed; 32 of the patients had conjunctivitis, 26 circinate balanitis, and six keratoderma blennorrhagica.

Harkness (1949, 1950), from a review of 125 patients, discussed at length the problem of "non-specific" urethritis and its complications. He was the first to state authoritatively that the usual clinical pattern of joint disease associated with a gonorrhoeal urethral discharge was identical with that following "non-specific" urethritis. In other words the arthritis following gonorrhoea was not a "true gonococcal arthritis" in the majority of cases. Harkness substantiated this contention with evidence derived from chemotherapy. The gonococcus is extremely sensitive to penicillin, and penicillin-resistant gonococci are rarely found; yet penicillin given for gonorrhoeal urethritis did not prevent the development of arthritis, nor did penicillin have any effect on the course of the arthritis when it was already present at the beginning of treatment. Levy (1950) supported this hypothesis from his experience of infective arthritis in Army personnel treated at

Netley Hospital, where he saw 106 patients with the disease. He too observed that the arthritis following gonorrhoea behaved similarly to that following "non-specific" urethritis.

The aetiology of the arthritis is inevitably associated with the cause of "non-specific" urethritis. Harkness favoured a virus or a pleuropneumonia-like organism as being the responsible agent; however inclusion bodies are only infrequently found in urethral, synovial, and conjunctival cells, and all attempts at culturing viruses have failed. Edward (1952) reviewed the relationship of the pleuropneumonia-like organisms with human disease and concluded that there was no proof that the organisms were anything more than commensals. Levy suggested that some of the manifestations of the disease were most readily explained by the mechanism of tissue hypersensitivity to the gonococcus; the disease would thus bear the same relationship to the gonococcus as rheumatic fever bears to the streptococcus. Other workers have felt that the gonococcus may exist in a different form from its usual coccal state, and that this, possibly filtrable, form might be the cause of the disease. Up to the present it is true to say that there is nothing more than circumstantial evidence to support any of these three hypotheses.

Observations on the Relationship of the Gonococcus to Venereal Arthritis

Case 1, a man of 57, was admitted to a surgical ward in November, 1944, with a diagnosis of cellulitis of the left middle finger. He had hit this finger at work 3 weeks previously, and since then it had become increasingly painful. On admission, the middle finger of the left hand was described as "red, greatly swollen, hot, and tender. Pus localized to back of proximal phalanx". The general examination was otherwise within normal limits, apart from low grade fever of 99° F. Treatment was started with sulphanilamide and on the fifth day in hospital 1.5 ml. pus was aspirated and 1,000 units penicillin injected locally. *N. gonorrhoeae* was cultured from the pus. In spite of a second injection of 1,000 units penicillin the swelling discharged and on the twelfth day in hospital an incision was performed and 5

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ml. blood-stained pus evacuated. It was noted at operation that the interphalangeal joint could be moved in all directions, indicating articular destruction. The pus obtained was sterile, but Gram-negative intracellular diplococci were seen in the film. X-ray examination showed "disorganization of the proximal interphalangeal joint of the middle finger". The serum gonococcal complement-fixation test (G.C.F.T.) was positive. 20,000 units penicillin were injected intramuscularly 4-hrly for 6 days, and the patient was discharged after 3 weeks in hospital. At this time there was no evidence of urethritis and the patient denied exposure to risk of venereal disease; prostatic smears however showed an excess of leucocytes, and a vesiculo-prostatic culture 2 weeks later grew gonococci. No other proved case of suppurative gonococcal arthritis has been found in the records of the London Hospital over the past 15 years.

In the years 1950, 1951, and 1952, 21 patients have been admitted for arthritis associated with a manifest urethral discharge; two of these were admitted for second attacks in this 3-year period. In nine of these episodes the urethral discharge yielded gonococci, in twelve the urethritis was diagnosed as "non-specific", and in two penicillin had been given before the patients were seen in the Clinic, where bacteriological examination showed no gonococci.

Fig. 1 shows diagrammatically the relationship of the gonococcal urethritis to the development of the arthritis, and the relationship between antibacterial therapy and the onset and duration of arthritis in nine episodes in eight cases. It is not easy to fix the end-point of an individual attack of arthritis, for residual stiffness may persist for a variable period. The diagrams represent as nearly as possible the time during which the disease would be described as "active"; they do not show the severity of the arthritis, but an attempt has been made to indicate when improvement seemed to begin.

It will be seen that penicillin was given in Cases 3, 4, 5, 6 (two episodes), and 8 before the arthritis developed. In the other three (Cases 2, 7, and 9), the onset of arthritis preceded treatment, but after administration of penicillin, and later of either aureomycin or streptomycin, it persisted for 3, 12, and 2 months respectively.

The clinical course of the arthritis in these eight patients with gonorrhoea was in no way different from that in the other thirteen patients. Conjunctivitis occurred in both attacks experienced by Case 6 and in Cases 4 and 9. In Case 7 conjunctivitis and widespread keratoderma blennorrhagica developed and were followed by iritis at the end of 11 months in hospital. Of the patients with "non-specific" urethritis, four had conjunctivitis. In the

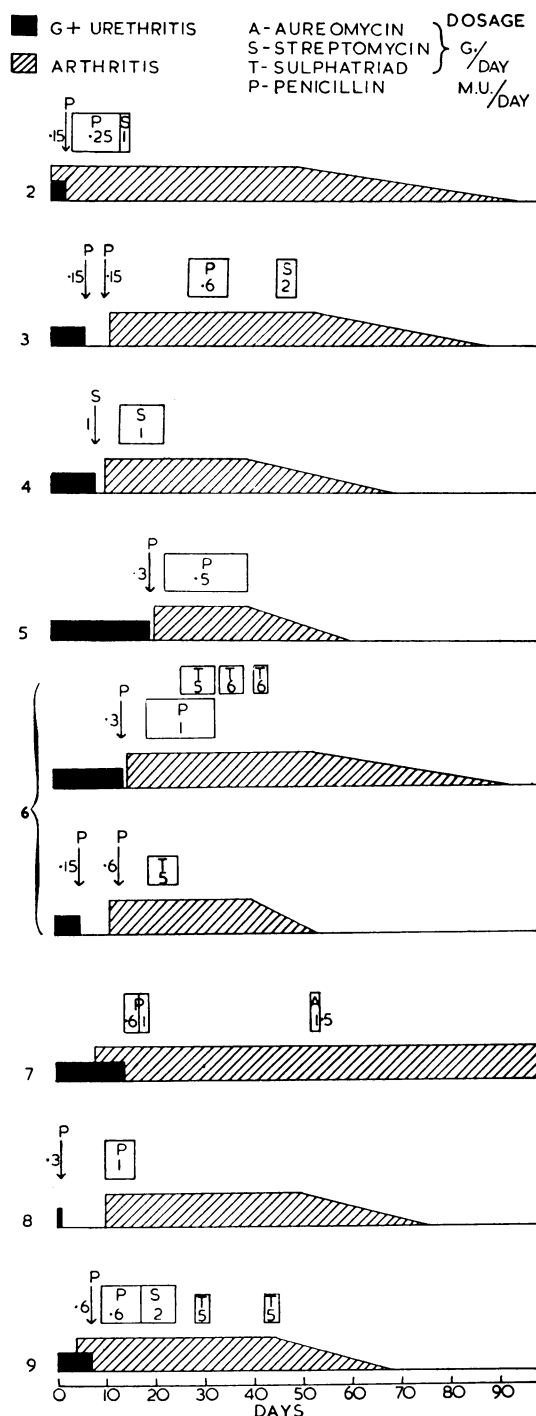


FIG. 1.—Duration of arthritis in relation to onset and duration of gonococcal urethritis and treatment with antibiotics Cases 2, 3, 4, 5, 6 (two episodes), 7, 8, and 9.

3-year period of the present study the arthritis did not follow so severe a course in any patient with "non-specific" urethritis as that which followed gonorrhoea in Case 7. But in 1948 one patient (Case 23) had a similar severe polyarthritis of 6 months' duration with conjunctivitis and keratoderma blennorrhagica following "non-specific" urethritis.

This evidence supports the view that the common form of venereal arthritis is not true gonococcal arthritis. When this latter condition does occur it is a pyogenic arthritis leading to suppuration and destruction of the joint.

Treatment

Antibacterial Therapy in Arthritis following Non-Specific Urethritis.—Fig. 2 shows the result of treatment with antibiotics of nine episodes of arthritis in eight patients (two attacks in Case 16). The duration of arthritis is again represented diagrammatically, and it will be apparent that aureomycin, streptomycin, "Sulphatriad", and penicillin in ordinary therapeutic dosage had no action on the course of the arthritis.

In two patients (Cases 19 and 22) streptomycin 1 and 2 g. daily in the treatment of the "non-specific" urethritis did not prevent the development of arthritis. In these two patients aureomycin was given later, but not until 5 and 2 weeks respectively after the onset of the arthritis, at a time when spontaneous remission could be expected. In Case 21 aureomycin 1.5 g. daily was administered for the non-gonococcal urethral discharge, but polyarthritis arose 3 weeks later, and continued for 5 weeks before subsiding spontaneously. One patient (Case 20) received "Sulphatriad" 4–6 g. daily combined with fever therapy, but he was not given any antibiotic; his arthritis persisted for 6 weeks.

Artificial Fever, ACTH, and Cortisone in the Treatment of Venereal Arthritis.—Artificial fever therapy has been used for many years in the treatment of venereal arthritis, yet its effectiveness has never been adequately assessed. Fever is induced by intravenous injection of foreign protein (*B. coli* or T.A.B. organisms) and by the Kettering hypertherm or similar apparatus; treatments are most commonly given once or twice a

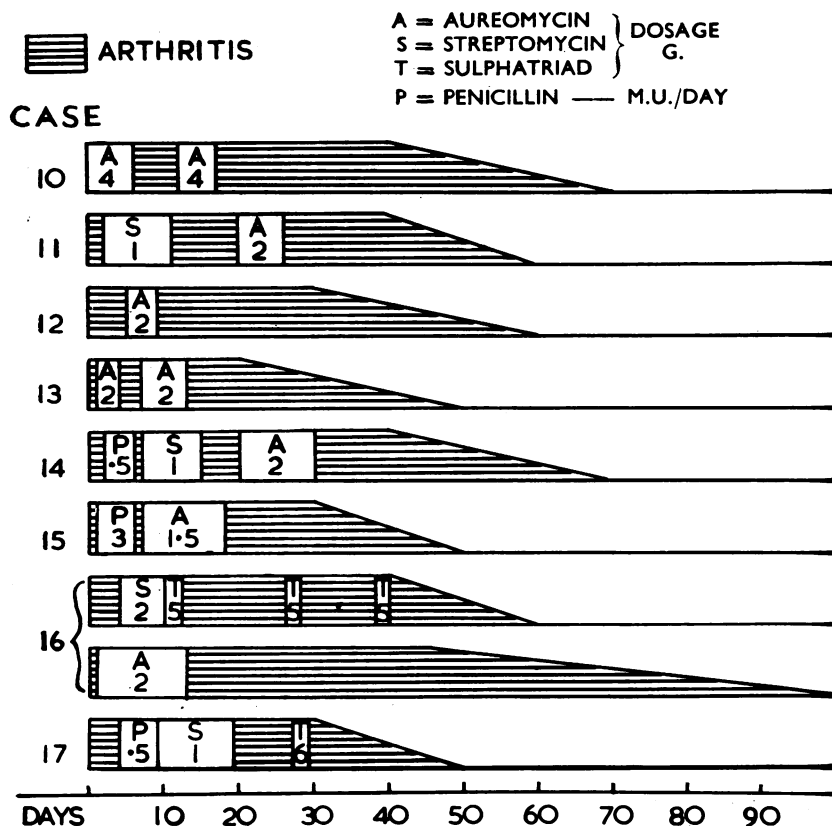


FIG. 2.—Duration of arthritis following "non-specific" urethritis in relation to treatment with antibiotics, Cases 10, 11, 12, 13, 14, 15, 16 (two episodes), 17.

week. There is usually a transient appreciable improvement in the arthritis during the first or second day after a treatment, and this is followed by some degree of relapse. In general it is claimed that the disease goes into remission after a number of treatments. The evaluation of such a regime is difficult, because the natural history of the disease is variable, and improvement may well occur independently of treatment after 2 weeks or more. Clearly any form of therapy that continues over 3 to 4 weeks will often coincide with spontaneous remission. The immediate transient improvement occurring 24–48 hrs after fever therapy may be due to temporary adrenal stimulation by this drastic procedure acting as a non-specific shock.

Fever therapy varies in effectiveness according to the method used and the skill of the operator. The Kettering hypertherm is generally agreed to be most satisfactory in maintaining a high temperature for a long time. During the past 5 years fever therapy at the London Hospital has been given by intravenous "Pyrifer" (*B. coli*) or T.A.B. vaccine. Therefore no dogmatic opinion will be expressed, but the three following cases are cited, the last two of which also illustrate the effect on the disease of ACTH and cortisone.

Case 23, a man aged 28, was admitted to the London Hospital in March, 1948, with "non-specific" urethritis, conjunctivitis, and polyarthritis. During the fourth, fifth, and ninth weeks in hospital he was given fever treatment with "Pyrifer". Fever was maintained above 104° F. for 5½, 8, and 7 hrs respectively. On both the second and third occasions the fever remained above 105° F. for 5 hrs. The arthritis was unaffected and persisted for 6 months with severe associated keratoderma blennorrhagica.

Case 24, a man aged 28, was admitted to the London Hospital in September, 1952. In August, 1952, 5 days after sexual intercourse, the left knee had become painful and the right eye inflamed; circinate balanitis developed but there was no urethral discharge. He was admitted to the London Lock Hospital where he received aureomycin and terramycin in addition to artificial pyrexia induced with "Pyrifer". The maximum

temperatures recorded were 104°, 104·6°, and 103·8° F. There was no improvement, and he was transferred to the London Hospital for a trial of ACTH. This, in a dose of 20 mg. 6-hrly, caused a temporary remission during 4 weeks administration. A relapse of the polyarthritis occurred as soon as hormone therapy was stopped, and in addition keratoderma blennorrhagica appeared on the feet and superficial erosions on the dorsum of the tongue. The polyarthritis mainly involved the right elbow, both wrists, both knees, and the small joints of the feet. He was unwilling to stay in hospital after 3½ months, and was discharged in January, 1953, when the arthritis was still "active" but slowly subsiding.

Case 7, a man aged 21, was admitted to the London Hospital in February, 1952, with gonococcal urethritis, conjunctivitis, and polyarthritis. The course of the disease is represented in Fig. 3, as the severity of the polyarthritis was closely related to the degree of the natural fever. Penicillin given in a dosage of 0·6 mega units daily for 3 days and 1 mega unit daily for 2 days did not affect his condition. As Fig. 3 shows, cortisone (200 mg. per day) and ACTH (150 mg. per day) each given for 5 days produced no improvement. The patient was then given artificial fever therapy on three occasions. The maximum temperatures in these three treatments were 106·6°, 105·8°, and 104·8° F. and the average time over which the fever was at or above 104° F. was a little over 3 hrs. The arthritis continued unabated. During the succeeding 6 months he was given courses of ACTH and cortisone of varying dosage and length and at this stage it was apparent that ACTH in a dosage of 100 mg. daily effectively suppressed the fever, arthritis, and widespread keratoderma blennorrhagica. Smaller doses were less effective, and at all times benefit only lasted while the hormone was given.

ACTH or cortisone was given to six patients during the past year (Cases 7, 8, 12, 18, 24, and 33). The results are well illustrated by the two cases (7 and 24) already discussed. Either hormone is capable of reducing fever and suppressing temporarily the various eye, skin, and joint manifestations of the disease. In Case 7 both ACTH and cortisone were apparently incapable of producing a therapeutic effect during the initial stages of the disease, but had an unquestionable suppressive

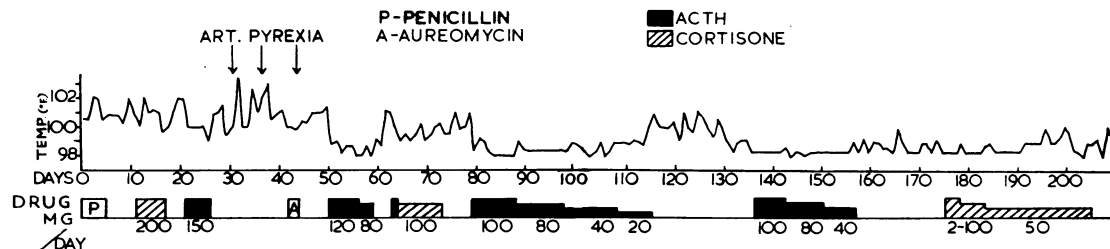


FIG. 3.—Course of fever in Case 7 in relation to treatment with ACTH and cortisone, the severity of the arthritis closely following the course of the fever.

effect several weeks later. This was interpreted as solely a matter of dosage, the amount of hormone required to suppress an inflammation being proportional to the severity of the inflammatory process. It is inferred that in this patient the inflammatory agent was more powerful in the initial stages of the disease than later.

The above facts concerning the therapy of venereal arthritis provide no evidence that the underlying cause of the disease is in any way affected by treatment available at the present time. Although symptoms may be alleviated there is no certain cure for the condition.

Course of Individual Attacks of Venereal Arthritis

As already noted from the writings of Brodie, Fournier, and Launois, supported by the later reports of Lees (1932), Myers and Gwynn (1935), Keefer and Spink (1937), King and others (1946), and Harkness (1949), the commonest clinical patterns of arthritis involve the knee joints, ankles, and feet. It is evident from the earlier accounts that the attacks are self-limiting, but they may persist for from 1 to 7 months before spontaneously subsiding. The later authors, however, usually attribute this spontaneous remission to the particular therapeutic agent they favour. The present study confirms this distribution of joint involvement, but tenosynovitis, so frequently described by others, was not observed. Localized swelling and tenderness over one part of the periarticular structures was frequently found in the absence of generalized swelling of the whole joint. Possibly this asymmetrical involvement of the periarticular tissues is regarded as tenosynovitis by some observers, but the term "tenosynovitis" should be restricted to the description of the appearances where the actual outline of the tendon sheath can be traced and recognized from the area of acute inflammation.

In recent years several patients have been seen at the London Hospital who have had severe and prolonged attacks of venereal arthritis. One patient (Case 7) remained in hospital for 11 months with polyarthritis affecting most of his joints, conjunctivitis, widespread keratoderma blennorrhagica, and later iritis; 14 months after the onset of the disease the only evidence of "active" arthritis was slight tenderness of the left tarsus and the fourth right metatarsophalangeal joint. There was, however, some residual ligamentous laxity of the knee and finger joints. In a second patient (Case 23), generalized polyarthritis, conjunctivitis, and keratoderma blennorrhagica followed "non-specific" urethritis. The disease persisted for over

6 months, but 3 years later there were no signs of "active" arthritis and the patient was working as a packer lifting heavy loads up to one hundred-weight. In three other patients (Cases 11, 16, and 25) recurrent subacute attacks involved many joints including one or several joints of the fingers. "Low grade" arthritis persisted for more than 6 months in each patient, but subsequent examination revealed no evidence of "active" arthritis, except for the feet in Case 25 and the spine in Case 16; these two features will be discussed later.

It is impossible therefore to assess the prognosis of an individual attack unless the patient has been followed for at least a year.

Course of Chronic and Recurrent Arthritis

The natural history of the disease in 21 patients will be discussed. These patients were selected on the following criteria:

- (a) presence of recurrent or chronic arthritis over a period of 5 years or more,
- (b) satisfactory evidence of genital infection.

In all except two patients arthritis and urethral discharge were associated on at least one occasion. In Cases 36 and 39 a diagnosis of genital infection was made on the basis of chronic prostatitis; both denied acute urethritis, though the finding of a positive G.C.F.T. in both made this denial suspect. Many patients who had had one attack of the disease were interviewed, but as there were no subsequent attacks they have been excluded.

Broadly speaking there are three main clinical syndromes of the disease in its chronic form, although, as far as one can tell, there is no fundamental difference between the groups:

- (1) multiple attacks without residual joint damage
- (2) residual deformities of the feet
- (3) ankylosing spondylitis.

Only two patients did not fall into one of these groups and they will be considered separately. Since this paper is concerned primarily with arthritis the problem of recurrent iritis will not be discussed in detail. Iritis, as Brodie first pointed out, is frequently observed with or without joint disease; six of the 21 patients had relapsing iritis.

In the present series, eleven patients had painful feet as a sequel to intermittent or chronic arthritis, whereas only seven had no residual joint damage. Yet those with no residual lesion may comprise the larger group, since they are less likely to come to notice in a follow-up enquiry. Ankylosing spondylitis occurred in four patients.

Multiple Attacks without Residual Joint Damage.—

The early clinical course of the seven patients in this group showed no particular features distinguishing

FIG. 4
(a)

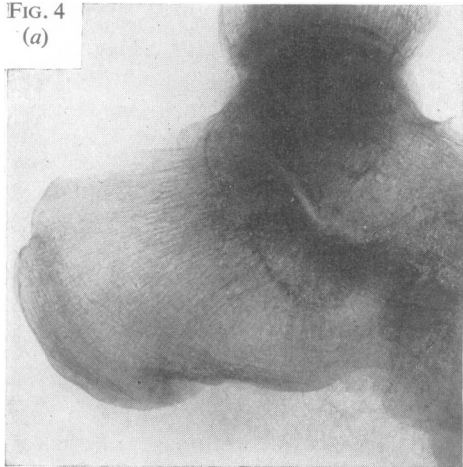


FIG. 4.—Case 36, calcanean spurs (both feet).

FIG. 5.—Case 29, periostitis of inferior and posterior surfaces of os calcis (both feet).

FIG. 6.—Case 31, periostitis of inferior and posterior surfaces of os calcis (left foot).

FIG. 7.—Case 32, periostitis of inferior and posterior surfaces of os calcis (left foot).

FIG. 4
(b)

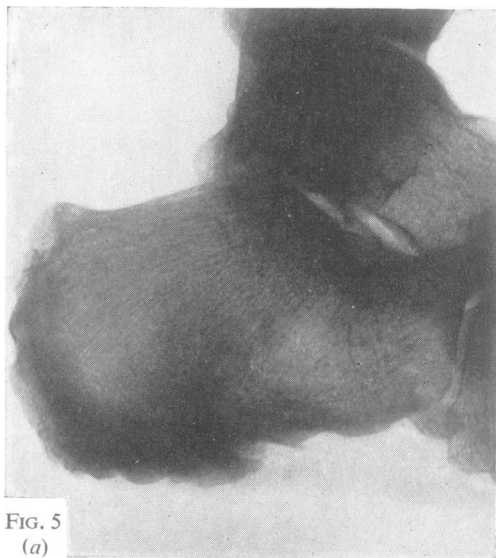
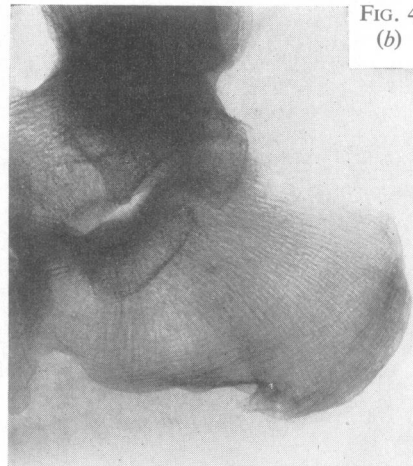


FIG. 5
(a)

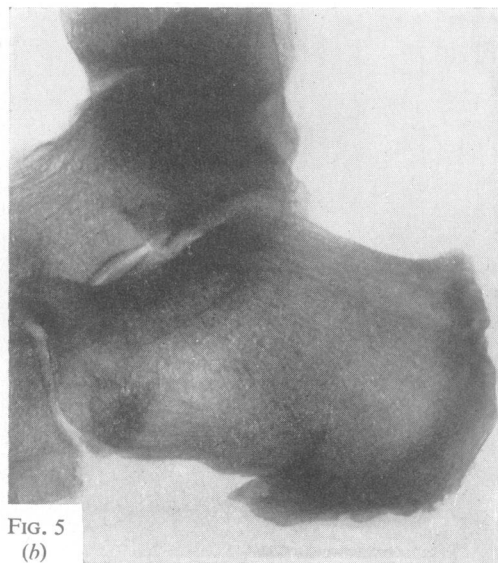


FIG. 5
(b)

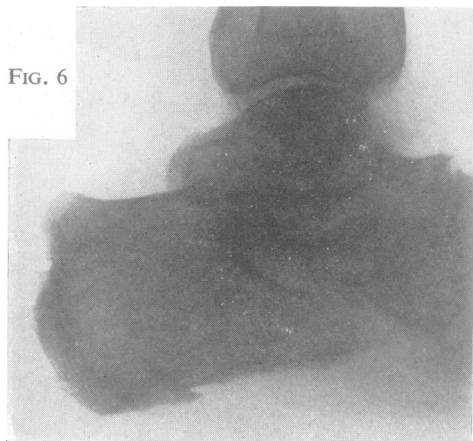


FIG. 6

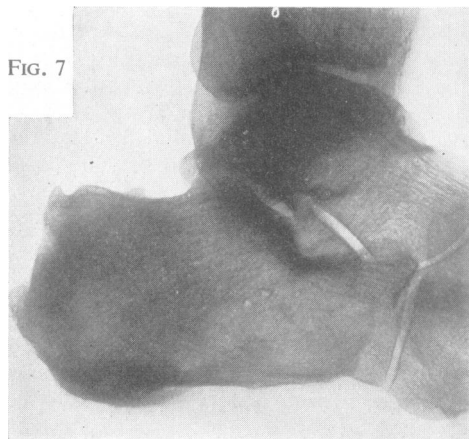


FIG. 7

them from the remainder. There were no differences in treatment, and the arthritis was associated with gonorrhoea in some and with "non-specific" urethritis in others. Conjunctivitis was present at one time or another in four of the seven patients, but none had iritis. The episodes of arthritis usually lasted up to 2 months, although in Case 27 the patient complained of arthritis of the left ankle followed by pain in the foot for nearly 5 months. One patient (Case 28) had seven episodes between 1945 and 1952, and another (Case 16) four attacks during 14 years' observation. In Cases 14 and 26 recurrent arthritis was observed during the 1930s but examination in 1952 revealed no sequelae. The arthritis was in no way characteristic in distribution. The knees and feet were usually affected, but a more generalized polyarthritis including a wrist, a thumb, and a finger occurred in Case 28, and finger joints were involved in Cases 21 and 26.

Residual Deformities of the Feet.—The commonest deformity of the feet was the painful calcanean spur occurring in eight of the eleven patients. The spur was typically "fluffy" or "ragged" in x-ray appearance, but sometimes the outline was sharply defined. The significance of these "clean-cut" spurs has been questioned, but pain in the heel was a symptom in two cases and the third had other deformities of the feet; in these three cases (e.g., Case 36: Fig. 4*a* and *b*) the spurs were larger than the common "traumatic" spur. Periostitis of the os calcis may extend over the entire inferior and posterior surfaces of the bone giving generalized tenderness of the heel (Cases 31 and 32) and an

irregularity of the margins of the bone in the radiograph (Cases 29, 31, 32: Figs 5, 6, 7). Pes planus was another residual deformity; in two patients (Cases 25 and 30: Fig. 8) it was extreme and walking was painful. In contrast, pes cavus was observed in three patients (Cases 8, 29, and 38: Figs 9, 10, 11, overleaf), and each had fixed dorsiflexion of all the toes at the metatarsophalangeal joints giving multiple hammer-toe deformities; a similar condition of the toes was also present, however, in Case 30 where pes planus was severe.

Ankylosing Spondylitis.—The fact that four patients (Cases 16, 35, 36, and 37) out of the 21 studied presented the clinical syndrome of ankylosing spondylitis was unexpected. The significance of this observation is open to question, since in a clinic population of this kind the discovery of four cases over the period of study could be due to chance. Nevertheless in each case the arthritis started in peripheral joints and the diagnosis of ankylosing spondylitis was made subsequently. Moreover it seems unlikely that the random selection from a general "rheumatism" clinic of 21 patients suffering from chronic or recurrent arthritis of peripheral joints would yield four cases of ankylosing spondylitis.

Other Sequelae.—It has been remarked that two cases (38 and 39) did not fall into any one of the groups just described.

Case 38.—This patient had urethritis, conjunctivitis, and polyarthritis in 1931 and subsequently a chronic relapsing iritis. From the initial attack onwards he complained of variable pain in the ankles, heels, and feet, and in 1947 fluid was removed from the knee on four occasions.

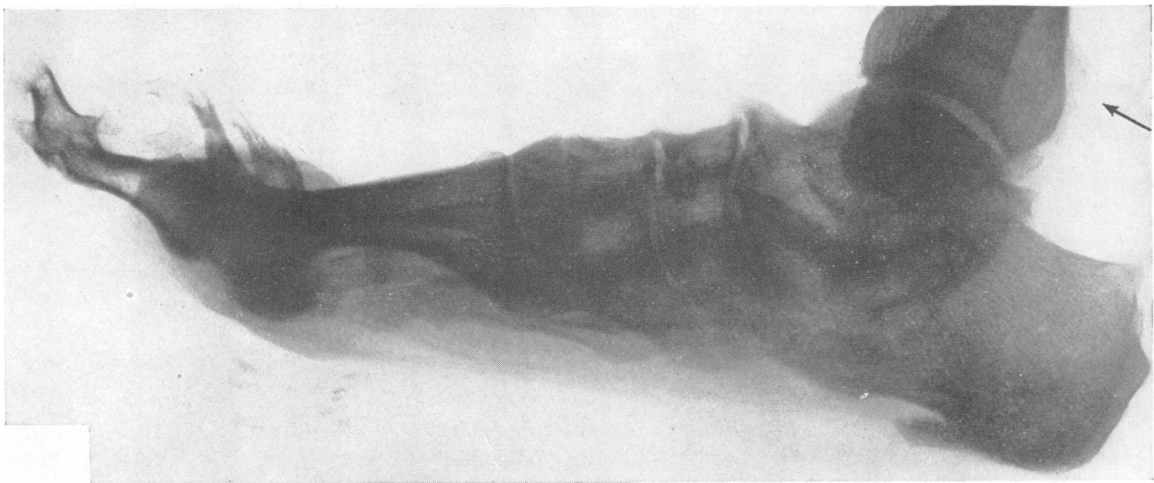


FIG. 8.—Case 30, pes planus, rough calcanean spur, lipping of tarsal joints, and periostitis of tibia posteriorly.

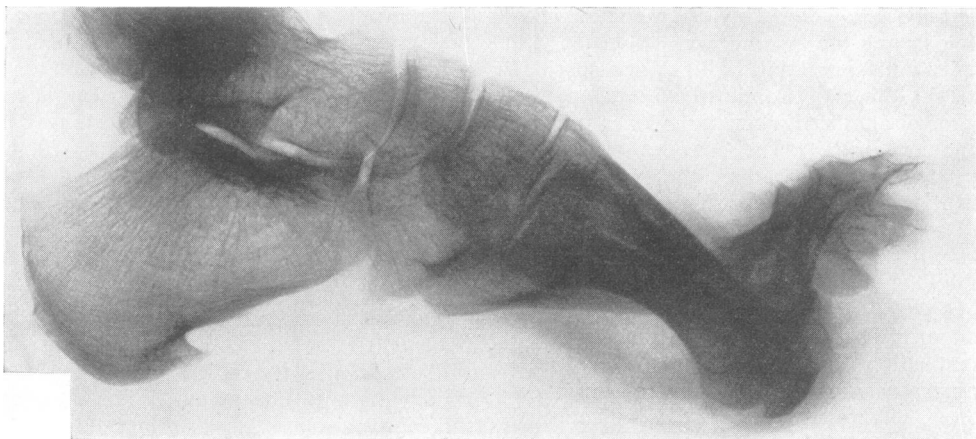


FIG. 9.—Case 8, pes cavus, dorsiflexion deformity of toes, and calcaneal spur with sharply defined outline (left foot).

“ Low grade ” arthritis of the left knee and elbow, and the metacarpophalangeal joint of the right index finger was followed by slight limitation of movement of the left shoulder and localized tenderness over the right acromioclavicular joint. In April, 1952, moderate pes cavus of both feet with tenderness of the heels and dorsiflexion contractures of the toes accompanied the chronic

arthritis of the other joints (Fig. 11). Thus this patient had not only the deformities of the feet common in venereal arthritis but also chronic arthritis of a number of other joints. He did not however have arthritis of the wrists or fingers except for the single metacarpophalangeal joint mentioned above, and there were no subcutaneous nodules.



FIG. 10.—Case 29 disorganization of metatarsophalangeal joints, subluxation, new bone formation, and lateral deviation of toes (both feet).

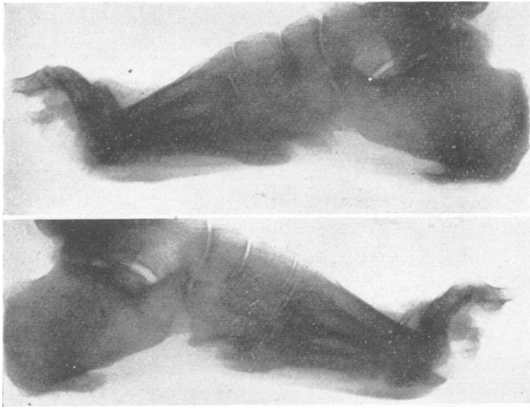


FIG. 11.—Case 38, large calcaneal spur and dorsiflexion deformity of toes (both feet).

Case 39.—This patient was admitted to hospital in 1942 with arthritis of the knees; evidence was found of chronic prostatitis with a positive G.C.F.T. He was re-admitted in 1944 complaining of pain in the right hip, but no objective signs of arthritis were observed and no comment was passed on his other joints. In 1952 and 1953 he had chronic arthritis of both elbows, both wrists, and several metacarpophalangeal and proximal interphalangeal joints in both hands, accompanied by subcutaneous nodules below the left elbow. The patient therefore showed the typical features of rheumatoid arthritis, but unfortunately the history was deficient in several important respects. The arthritis started while he was in prison and he was unduly reticent about the mode of onset; the records of his wartime admissions gave inadequate information about the duration and distribution of the arthritis; and there was no record of acute urethritis. It is thus difficult to relate the rheumatoid arthritis to the genital infection and the two conditions may have been coincidental.

Discussion

In recent years many writers have suggested that rheumatoid arthritis follows venereal infection. Hench and Boland (1946), who have propounded this view frequently, say:

It is not sufficiently understood that rheumatoid arthritis can be precipitated by a gonorrhoeal infection . . . also a mild, intermittent or quiescent rheumatoid arthritis can be aggravated by acute genital gonorrhoea.

And again Hench (1948) writes:

Thus it would appear that "post-gonorrhoeal rheumatoid arthritis" is now more common than gonorrhoeal arthritis.

It is a main argument of this paper that there is a distinct form of arthritis related to venereal urethritis, and that a careful study of these cases

shows a clear-cut difference from the natural history of classical rheumatoid arthritis. The predilection for the joints of the lower limbs, the periods of remission with acute or subacute self-limiting relapses, the frequency of associated conjunctivitis and iritis, the residual deformities in the feet in the absence of permanent joint damage in the hands or elsewhere, and the development of spondylitis, are all characteristic of this disease but are not features of rheumatoid arthritis. The evidence for regarding non-specific infective arthritis as identical with rheumatoid arthritis lies in two claims:

- (1) that if the patient is followed for a sufficient length of time the typical features of rheumatoid arthritis will develop,
- (2) that pathological studies fail to reveal a histological difference.

However, many of the patients quoted here have been observed for more than 10 years and in none did typical rheumatoid arthritis develop; the reasons for excluding Case 39 from this group have been given. No histological studies were made, but the pathological evidence may be interpreted incorrectly, for similar macroscopical and microscopical appearances do not necessarily indicate common causation; this has been clearly shown from the study of the morbid anatomy of the terminal stages of chronic Bright's disease. It is not possible to infer that venereal infection is the only, or even a common, cause of non-specific infective arthritis; nevertheless, the recognition of venereal arthritis as an entity is important because it is the only member of the group of chronic "proliferative" arthritides where the infectivity of the aetiological agent, the portal of entry, and the method of transmission are known.

Many venereologists believe that genital infection is a frequent cause of ankylosing spondylitis, and it is claimed (King, 1953) that careful examination of patients with ankylosing spondylitis will usually reveal evidence of chronic prostatitis. Forestier (1939), who had reviewed 153 patients with ankylosing spondylitis, stated:

In 60 per cent. of the cases a history of past genito-urinary infection is reported, . . . one-third of our patients had had some gonococcal infection some time previously.

An early diagnosis of ankylosing spondylitis is made when radiographic "blurring" of the sacro-iliac joints accompanies low back pain, and it is only later that the "poker back" and "bamboo spine" develop. In the spine the disease usually runs a predictable course, but the frequency of associated arthritis in the peripheral joints has been

repeatedly debated. The classical view held in England (Buckley, 1948) is that the disease is usually confined to the spine but that progressive ankylosis of the hips and shoulders may occur in the late stages; involvement of peripheral joints is considered exceptional. This conflicts with American opinion (Boland, 1949), which regards peripheral arthritis as common and refers to the condition as "rheumatoid spondylitis", although the absence of rheumatoid nodules and the classical "rheumatoid hand" is admitted.

The four patients described above in whom the spine was affected did not conform to the pattern of classical ankylosing spondylitis where progressive spinal stiffness is always the predominant symptom; on the contrary, in each patient there was an initial polyarthritis or arthritis of the ankles and feet, and it was only subsequently that spinal stiffness arose. It is possible that the divergent views on the frequency of peripheral arthritis in ankylosing spondylitis may reflect the existence of two syndromes of unrelated aetiology; cases in which both the spine and peripheral joints are affected may result from venereal infection, whereas the "classical" syndrome may be caused by some other agent. This is suggested by Buckley (1943):

If the hands or feet are affected before or simultaneously with the spine, the diagnosis is not ankylosing spondylitis, but infective arthritis, possibly of gonorrhoeal origin, affecting the spine.

Buckley quotes the work of Batson (1940), who showed the presence of venous anastomoses between the prostatic venous plexus and the vertebral veins, and suggests that this is a possible route of spread of the aetiological agent from the infective focus in the prostate to the spine. Venereal infection is not, however, the only cause of spinal and peripheral arthritis, for Marche (1950) observed sacro-iliac arthritis as a prelude to ankylosing spondylitis in the post-dysenteric syndrome.

In this paper the term "venereal arthritis" has been used to describe arthritis following venereal urethritis when the gonococcus cannot be isolated from the joints and the disease does not run the course of a suppurative arthritis. The term "gonococcal arthritis" has been restricted to the condition where gonococcal invasion of the synovial tissues has been proved. It is conceded that the arthritis following dysentery may be similar in clinical features and natural history to venereal arthritis, but the mode of infection is so different that the alternative title of "post-dysenteric arthritis" has been used. The name "infective arthritis" has been avoided as too indefinite, and the more informative "infective

arthritis of venereal origin" as too long. The condition has frequently been called "Reiter's disease" or "Reiter's syndrome", but these are unsatisfactory names, because Reiter's paper made a negligible if not misleading contribution to the subject, since he described one case following dysentery and attributed the arthritis to a spirochaete, and because confusion ensues when ocular manifestations are absent, as indeed they usually are. Hollander (1946) suggested the term "infectious uro-arthritis" but this implies infection of the urinary tract rather than of the genital organs. Correct nomenclature will have to await the discovery of the cause of the disease.

This paper has been concerned with arthritis and venereal infection in men and no observations on women have been offered. It was thought that no conclusions of value could be obtained from a study of women for the following reasons: gonorrhoea in women is frequently overlooked since the symptoms are so mild; "non-specific" venereal infection in women is difficult to diagnose with certainty; in recent years the association of arthritis with venereal infection in women is uncommon*; both the pattern of joint disease which follows venereal infection in men and the triad of urethritis, arthritis, and conjunctivitis are rarely seen in women.

Summary

(1) The usual form of arthritis following gonorrhoea is identical with that following "non-specific" urethritis and it is an entity with a recognizable distribution and clinical course.

(2) The natural history of the disease is characterized by self-limiting attacks of about 1 to 12 months' duration, but recurrent or chronic arthritis may lead to residual deformities of the feet and occasionally to ankylosing spondylitis; permanent joint damage elsewhere is unusual and rheumatoid arthritis is not a sequel.

(3) The arthritis is unaffected by treatment with antibiotics but temporary suppression of the clinical symptoms may be achieved by the administration of ACTH or cortisone; it has yet to be proved that fever therapy is an effective treatment.

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* In the past 18 months only two cases have been seen at the Whitechapel Clinic and in the last 5 years only four patients have been admitted to the London Hospital.

Director of the Department of Physical Medicine at the London Hospital, each of whom made available their clinical records and permitted the author to examine their cases.

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